

Predictability and Diagnosis of Low-Frequency Climate Processes in the Pacific

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Our project aims to improve understanding and predictions of decadal-time scale climate variability in the Pacific Ocean and North America. The investigations will range from the large scale physics of decadal and anthropogenically climate change, to their predictions and regional impacts over North America. Fundamental dynamics of decadal and anthropogenically forced climate variability in the North and South Pacific Ocean will be explored. This includes investigations of adjustments of the wind-driven ocean circulation on both hemispheres, of the physics underlying the hemispheric symmetry of decadal changes, and of North Pacific variability in a climate change scenario. We will explore aspect of making climate predictions including the effect of different ocean temperature initial conditions on the future climate, and the effect of specifying predictable oceanic heat flux convergences in coupled models. Finally, we will study the effects of natural and anthropogenically forced climate variability on the North American monsoon, U.S. west coast, and physics and biology of the California current system. The work will rely on existing integrations of the parallel climate model, and results available from the ACPI project, augmented by additional integrations and numerical experiments. In addition, we will develop code to efficiently estimate probability density functions of climate variables.

DOE supported publications:

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